

CURRENT LISTING OF CLAIMS

1. (Currently amended) A process for the polymerisation of ethylene or ethylene and at least one C₃₋₂₀ alpha olefin comonomer in the slurry or solution phase in a reactor having a polymer outlet stream, a procatalyst or catalyst feed stream and a hydrogen feed stream, said polymerisation being effected in the presence of a metallocene catalyst, a diluent and hydrogen, ~~characterised in that~~ wherein said diluent is recycled from said outlet stream to said hydrogen feed stream, said procatalyst or catalyst feed stream is free of hydrogen, said hydrogen feed stream is free of procatalyst or catalyst and said procatalyst or catalyst feed stream does not comprise recycled diluent.

2. (Previously presented) A process as claimed in claim 1 wherein the metallocene catalyst is fed to the reactor.

3. (Previously presented) A process as claimed in claim 1 wherein said process takes place in the slurry phase.

4. (Previously presented) A process as claimed in claim 1 wherein said diluent is propane, n-butane or isobutane.

5. (Previously presented) A process as claimed in claim 1 wherein said metallocene catalyst is supported.

6. (Previously presented) A process as claimed in claim 1 wherein said comonomer is butene, octene or hexene.

7. (Previously presented) A process as claimed in claim 1 further comprising a gas phase polymerisation stage subsequent to said slurry or solution polymerisation.

8. (Previously presented) A process as claimed in claim 1 wherein said metallocene catalyst is prepolymerised.

9. (Previously presented) A process as claimed in claim 1 wherein said catalyst feed stream comprises a catalyst feed vessel in which said metallocene catalyst is resident for at least 2 hours.

10. (Previously presented) A process as claimed in claim 1 wherein prior to said process a Ziegler-Natta catalysed polymerisation is effected.

11. (Currently amended) A process as claimed in claim 10 wherein the change from Ziegler-Natta to metallocene catalysis is effected continuously (~~i.e. without reactor shutdown~~) by stopping the feed of Ziegler-Natta catalyst feed and starting metallocene catalyst feed to the reactor.

12. (Currently amended) A process as claimed in claim 1 wherein said metallocene catalyst comprises a compound of formula



wherein M is a group 3 to 10 transition metal;

each X' is halogen, diC₁₋₆-alkylamido, C₁₋₆ alkyl, benzyl or hydrogen; and

each Cp' is an unsubstituted cyclopentadienyl or indenyl group or a cyclopentadienyl or indenyl group substituted by one or more groups selected from the group consisting of C₁₋₁₀ hydrocarbyl and [[or]] siloxy, said Cp' groups being bridged or not bridged.

13. (Currently amended) A process for the polymerisation of ethylene or ethylene and at least one C₃₋₂₀ alpha olefin comonomer in the slurry phase or solution phase in a polymerisation reactor comprising the steps of:

continuously introducing ethylene or ethylene and ~~optionally~~ at least one C₃₋₂₀ alpha olefin comonomer into said reactor; continuously introducing diluent into said reactor; continuously introducing hydrogen into said reactor;

continuously or intermittently introducing a mixture of diluent and metallocene catalyst into said reactor;
operating the reactor to form a polymer slurry or solution;
continuously or intermittently removing said polymer slurry or solution from said reactor;
subjecting the withdrawn slurry or solution to separation treatment where at least part of the diluent therein is separated from the polymer;
recycling at least part of said separated diluent into the diluent feed;
wherein the diluent feed is free of catalyst and said mixture of diluent and metallocene catalyst is free of recycled diluent.

14. (Previously presented) A method of preventing metallocene catalyst deactivation in ethylene polymerization comprising using at least two feed streams, wherein a first stream comprises a metallocene catalyst and is free of hydrogen and a second stream comprises hydrogen and is free of metallocene catalyst to thereby prevent metallocene catalyst deactivation in ethylene polymerisation.

15. (Previously presented) A slurry polymerisation reactor having a polymer slurry outlet, catalyst feed inlet and hydrogen feed inlet, said slurry outlet having a conduit connecting to said hydrogen feed inlet adapted to allow recycling of diluent from said polymer slurry to said hydrogen feed.